

REMARKS

Upon entry of the foregoing amendments, claims 1-33 are pending and remain in the application. Entry of the amendments is proper since the amendments to the claims do not present any new matter. Claim 1 has been amended to recite the narrow concentration range of branching monomer residues and the narrow inherent viscosity range of the polyester. Support for this amendment may be found throughout the specification and particularly in the examples. Claim 7 has been amended to delete a redundant concentration range of branching monomer residues already recited in amended Claim 1. Claims 12, 19 and 32 have been amended to recite the specific, narrow concentration range of branching monomer residues and the specific narrow inherent viscosity range corresponding to amended Claim 1. Claim 20 has been amended to delete a redundant concentration range of branching monomer residues already recited in amended Claim 19. Amended Claim 19 has been further includes a process calendar roll temperature of about 160 °C to about 190 °C. Support for this amendment may be found throughout the specification and particularly at paragraphs [0070] and [0071].

Rejection of Claims 1-15, 16, 17-28, 29, and 30-33 under 35 U.S.C. §102(e)

Claims 1-15, 16, 17-28, 29, 30-33 have been rejected under 35 U.S.C. 102(e) over US 20040127609 to Strand *et al.* ("Strand"). Applicants respectfully traverse the rejection and statements made in support thereof.

Section 2131.03 of the MPEP, 8th ed., revision no.1 provides the standard for addressing the issue of prior art which teaches a range within, overlapping or touching the claimed range:

"When the prior art discloses a range which touches, overlaps or is within the claimed range, but no specific examples falling within the claimed range are disclosed, a

case by case determination must be made as to anticipation. In order to anticipate the claims, the claimed subject matter must be disclosed in the reference with "sufficient specificity to constitute an anticipation under the statute....If the claims are directed to a narrow range, the reference teaches a broad range, and there is evidence of unexpected results within the claimed narrow range, it may be reasonable to conclude that the narrow range is not disclosed with "sufficient specificity" to constitute an anticipation of the claims....The question of "sufficient specificity" is similar to that of "clearly envisaging" a species from a generic teaching."

Underlining added.

Applicants respectfully submit that the cited reference, Strand, both fails to disclose the specific elements of Applicants invention arranged as claimed and does not describe the claimed subject matter with sufficient clarity to be clearly envisaged by a person of ordinary skill in the art.

The anticipation rejection is grounded on the individual disclosures of Strand regarding the calendaring of flame retardant polyesters having a crystallization half time of at least 5 minutes, a plasticizer, a phosphorus-containing flame retardant miscible with the plasticized polyesters, in the presence of an additive effective to prevent sticking of the polyester to the calendaring rolls. Strand also states, separately, that the polyester may have a preferred inherent viscosity ranging from about 0.4 to about 1.2 dL/g and preferably from about 0.50 to about 1.0 dL/g (Page 4, paragraph [0030]) and that about 0.1 to about 2.0 mole% of a branching agent may be added to polyester to improve melt strength and melt viscosity. (Page 8, paragraph [0058]). None of the Strand examples include a branching agent. (Pages 8-11).

Amended Claim 1 of the instant application is directed to a polyester having a crystallization half time of at least 5 minutes, about 0.1 to about 0.3 weight percent

branching monomer residues, and an inherent viscosity of about 0.60 to about 0.70 dL/g in the presence of an additive effective to prevent sticking of the polyester to the calendaring rolls. The present claims recite a very specific, narrow range for both branching monomer and inherent viscosity as opposed to the general disclosure of Strand.

Strand is directed to a general disclosure of flame retardant polyester compositions for calendaring and does not provide any embodiment in which all of the elements of the claimed invention are described together or related to each other. For example, Strand discloses in paragraph [0030] an IV of 0.4 to 1.2 dL/g and an IV of 0.5 to 1.0 dL/g, which have IV ranges of 0.8 dL/g and 0.5 dL/g, respectively. Amended Claim 1 recites an IV of 0.6 to 0.7 dL/g, which is a range of 0.1 dL/g. Amended Claim 1 has an IV range that is only 12.6% to 20% of the IV ranges disclosed by Strand. The amount of branching agent in Strand is reported as 0.1 to 2.0 mole %, whereas Applicants' claims recite 0.1 to 0.3 weight %. The mole % reported by Strand was converted to weight % to allow a direct comparison for a representative set of esters based on the four combinations of the high molecular weight naphthalenedicarboxylic acid and low molecular weight terephthalic acid and the high molecular weight bisphenol A and low molecular weight ethylene glycol from paragraphs [0025] and [0028], respectively, of Strand. The 0.1 to 2.0 mole % in Strand corresponds to 0.02 to 1.72 weight % for the representative group of esters. Applicants claimed 0.1 to 0.3 weight %, a range of 0.2 weight %, is only a fraction of the range of the weight % corresponding to Strand, e.g., Applicants weight % range is only 11.8% of the entire range of Strand. The chance that one would pick a polyester having Applicants' claimed values with respect to IV and branching agent is bounded on the low side by (12.6%) times (11.8%), which equal 1.5% and on the upper side by (20%) times (11.8%) which equals 2.4%. In other words, absent Applicants disclosure one would have only about a 1.5 to 2.4% chance of selecting, from the Strand disclosure, an acid, a diol and a branching agent within Applicants claims and would have no basis for expecting the unexpected results shown in the instant application. This demonstrates that producing

Applicants' narrow range from the broad disclosure of Strand by random optimization would be extremely unlikely.

The unexpected results are illustrated in Tables 4 and 5, example 5. Example 5 has 0.20 wt % branching monomer and an inherent viscosity of 0.65 dL/g. The significantly and unexpectedly lower total resistance to roll and reduced bearing pressure translate into the ability to significantly increase productivity in the calendaring process. The increased productivity is not found by only lowering viscosity, example 4, or adding a branching agent, example 3. Adding a plasticizer lowers the processing temperature. The present invention discovered that "[e]ven at the lower processing temperatures, the branched composition having the lower I.V. (Example 9) showed a lower bearing pressure and lower rotational force in comparison to the higher I.V. and non-branched materials." [0086]. The general disclosures of Strand do not teach the claimed invention. The differences in the teachings of the references along with the unexpected results show that Strand's general disclosure did not teach the range with "sufficient specificity." In the absence of Applicants' own disclosure, there is nothing in Strand that would have guided the skilled person to select a branching monomer in combination with a polyester having the desired IV range with sufficient specificity to make the claimed invention.

Applicants respectfully submit that the independent claims are in condition for allowance and, consequently, all dependent claims, which depend from allowable claims, are also in condition for allowance.

In view of current amendments and for the above reasons, Applicants respectfully submit that the disclosure of Strand does not anticipate the claimed invention. Applicants request, therefore, that the rejection be withdrawn.

Rejection of Claims 1-15, 17-28, and 30-33 under 35 U.S.C. §102(b)

Claims 1-15, 17-28, and 32-33 are rejected under 35 U.S.C. §102(b) over U.S. Patent No. 6,068,910 to Flynn et al. ("Flynn"). Applicants respectfully traverse the

rejection and the statements made in support thereof. The shortcomings of Strand and the arguments set forth above apply to the 102(b) reference, Flynn.

Applicants respectfully submit that the cited reference, Flynn, both fails to disclose the specific elements of Applicants invention arranged as claimed and does not describe the claimed subject matter with sufficient clarity to be recognized by a person of ordinary skill in the art. See MPEP 2131.03, 8th ed., revision no. 1.

The anticipation rejection is grounded on the individual disclosures of Flynn regarding the calendaring of polyesters having a crystallization half time of at least 5 minutes in the presence of an additive effective to prevent sticking of the polyester to the calendaring rolls. Flynn also states, separately, that the polyester may have an inherent viscosity ranging from about 0.4 to about 1.5 dL/g preferred inherent viscosity ranging from about 0.6 to about 1.2 dL/g (col. 3, lines 62-67) and that about 0.1 to about 2.0 mole% of a branching agent (col. 3, lines 43-49) may be added to polyester to improve melt strength and melt viscosity. The examples of Flynn do not include branching agents. (Col. 6, line 46 to col. 9, line 57)

Amended Claim 1 is directed to a polyester having a crystallization half time of at least 5 minutes, about 0.1 to about 0.3 weight percent branching monomer residues, and an inherent viscosity of about 0.60 to about 0.70 dL/g in the presence of an additive effective to prevent sticking of the polyester to the calendaring rolls. The present claims recite a very specific, narrow range for both branching monomer and inherent viscosity as opposed to the general disclosure of Flynn. Amended Claim 1 recites an IV of 0.6 to 0.7 dL/g, which is a range of 0.1 dL/g. Amended Claim 1 has an IV range that is only 9.1% to 16.7% of the IV ranges disclosed by Flynn. The amount of branching agent in Flynn is reported as 0.1 to 2.0 mole %, whereas Applicants' claims recite 0.1 to 0.3 weight %. The mole % reported by Flynn was converted to weight % to allow a direct comparison for a representative set of esters based on the four combinations of the high molecular weight naphthalenedicarboxylic acid and low molecular weight terephthalic acid and the high molecular weight 1,4-cyclohexanedimethanol and low molecular

weight ethylene glycol from col. 3, lines 29-36 and lines 50-61, respectively. The 0.1 to 2.0 mole % in Flynn corresponds to 0.02 to 1.72 weight % for the representative group of esters. Applicants claimed 0.1 to 0.3 weight %, a range of 0.2 weight %, is only a fraction of the range of the weight % corresponding to Flynn, e.g., Applicants weight % range is only 11.8% of the entire range of Flynn. The chance that one would pick a polyester having Applicants' claimed values with respect to IV and branching agent is bounded on the low side by (9.1%) times (11.8%), which equal 1.1% and on the upper side by (16.7%) times (11.8%) which equals 2.0%. In other words, absent Applicants disclosure one would have only a 1.1 to 2.0% chance of selecting, from the Flynn disclosure, an acid, a diol and a branching agent within Applicants claims and would have no basis for expecting the unexpected results shown in the instant application. Applicants' narrow range from the broad disclosure of Flynn by random optimization would be extremely unlikely.

Flynn teaches broad ranges, but the present invention claims a narrow range with unexpected results illustrated, for example, in Table 4, example 5. Example 5 has 0.20 wt % branching monomer and an inherent viscosity of 0.65 dL/g. The significantly and unexpectedly lower total resistance to roll translates in the ability to significantly increase productivity in the calendaring process. In the absence of Applicants' own disclosure, there is nothing in Flynn that would have guided the skilled person to select a branching monomer in combination with a polyester having the desired IV range with sufficient specificity to make the claimed invention. The additional reasoning and examples cited in the argument to overcome the Strand reference set forth above apply to Flynn. The differences in the teachings of the references along with the unexpected results show that Flynn's general disclosure did not teach the range with "sufficient specificity."

Applicants respectfully submit that the independent claims are in condition for allowance and, consequently, all dependent claims, which depend from allowable claims, are also in condition for allowance.

In view of current amendment and for the above reasons, Applicants respectfully submit that the disclosure of Flynn does not anticipate the claimed invention. Applicants request, therefore, that the rejection be withdrawn.

Conclusion

In view of the foregoing amendment and remarks, Applicants believe the application to be in condition for allowance. Accordingly, the Examiner is respectfully requested to reconsider the rejection, enter the above amendment, remove all rejections, and pass the application to issuance.

Respectfully submitted,

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Date